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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 09/588,353 | 06/07/2000 | Tetsuya Minakami | SON-469 US | 8798 |
| 7590 | 12/05/2003 | | EXAMINER | LINTON, HEDLEY O |
| Whitham Curtis & Christofferson PC 11491 Sunset Hills Road Suite 340 Reston, VA 20190 | | | ART UNIT | PAPER NUMBER |
| | | | 2615 | <i>6</i> |
| DATE MAILED: 12/05/2003 | | | | |

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | |
|------------------------------|-----------------|-------------------|
| Office Action Summary | Application No. | Applicant(s) |
| | 09/588,353 | MINAKAMI, TETSUYA |
| | Examiner | Art Unit |
| | Hedley Linton | 2615 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on _____.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-8 is/are rejected.
- 7) Claim(s) 9 and 10 is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) The proposed drawing correction filed on _____ is: a) approved b) disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
 - a) The translation of the foreign language provisional application has been received.
- 15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

| | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>3 ans 4</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

2. Claims 4 and 5 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is not clear how a horizontal difference signal may be a signal **corresponding** to a luminance difference between horizontally adjacent pixels and **at the same time** a signal **corresponding** to a difference between digital video camera CCD output signals vertically adjacent at the same pixel position as set forth in claim 4 nor is it clear how a horizontal difference signal may be a signal **corresponding** to a difference in green signal between horizontally adjacent pixels and **at the same time** a signal **corresponding** to a difference between digital video camera CCD output signals vertically adjacent at the same pixel position as set forth in claim 5.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over The Applicant's Admitted Prior Art in view of Maenaka et al (US Patent No: 5555023).

5. Regarding claim 1, The Applicant's Admitted Prior Art discloses an edge correction apparatus for a digital video camera comprising the following limitations of claim 1 (see applicant's figure 1 also labeled "Prior Art"):

- A horizontal edge signal generator and a vertical edge signal generator for respectively generating horizontal and vertical edge correction signals in horizontal and vertical directions of a sensed image obtained via an image-sensing element of a digital video camera.
- A horizontal edge signal gain controller and a vertical edge signal gain controller for controlling gains of the horizontal and vertical edge correction signals respectively from the horizontal edge signal generator and the vertical edge signal generator.
- An adder for adding the horizontal and vertical edge correction signals whose gains are controlled by the horizontal edge signal gain controller and the vertical edge signal gain controller.
- A slice processor for adding, to an image processing signal of the digital video camera, an edge correction signal obtained by performing slice processing for an edge signal output from the adder.

The Applicant's Admitted Prior Art does not disclose a vertical edge component suppression position detector for causing the vertical edge signal gain controller to execute gain control of the vertical edge correction signal in accordance with a horizontal difference signal output from the horizontal edge signal generator.

Maenaka et al disclose a signal processing circuit for a digital video camera that prevents a false aperture signal being generated. Specifically, Maenaka et al detects a horizontal (Sh) and vertical (Sv) correlation value on the basis of a signal from the image sensing device and a mixing ratio (gain) of the vertical and horizontal aperture signal is controlled on the basis of the correlation values (Maenaka et al, column 4, lines 14-24). Coefficient K1, that is applied to the vertical aperture signal (Vap) is determined using the equation $K1=Sv/(Sh+Sv)$. This teaches that if the horizontal correlation is weaker than the vertical correlation, then K1 becomes small and the vertical aperture signal is attenuated, that is if $Sh>Sv$, then K1 decreases (Maenaka et al figure 1, column 5, equation 5, lines 37-40). Therefore the vertical aperture correction signal (Vap) is controlled in accordance with the signal (Sh). Since the horizontal correlation value (Sh) may be calculated using the equation $Sh1=|(G11+G31)/2-(G13+G33)/2|$, then Sh is clearly a horizontal difference signal value because when the equation is expanded it becomes $Sh1=(1/2 *|G11-G13|) + (1/2 *|G31-G33|)$ wherein, and with reference to Maenaka et al figure 9, G11 and G13 are horizontally adjacent green pixels, and G31 and G33 are also horizontally adjacent green pixels (Maenaka et al figure 9; column 6, lines 18-23, and equation 7). Therefore the vertical aperture correction signal (Vap) is controlled in accordance with the horizontal difference or horizontal correlation signal (Sh). The applicant's admitted prior art uses the horizontal difference signal as a horizontal edge (aperture) signal thereby proving that this is a well known concept (Applicant's disclosure, page 7, equation 6; Applicant's submitted drawings figure 3 also labeled "Prior Art"). Since it is well known to use a horizontal

difference signal as a horizontal edge (aperture) signal and since the horizontal correlation value (S_h) disclosed by Maenaka et al is also a horizontal difference signal, then it would have been obvious to use a horizontal difference signal generated in the horizontal edge signal generator of the applicant's admitted prior art as the horizontal correlation value in order to calculate a coefficient to be used in the adjusting of the gain of the vertical aperture (edge) as taught by Maenaka et al. Using the horizontal difference signal generated in the horizontal edge signal generator of the applicant's admitted prior art as the horizontal correlation value would reduce the amount of hardware necessary to implement the invention thereby reducing costs. Then the vertical edge correction signal would be controlled in accordance with a horizontal difference signal output from the horizontal edge signal generator. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the applicant's admitted prior art using the teachings of Maenaka et al in order to arrive at the applicant's invention as claimed in claim 1 since doing so is obvious and would reduce the amount of hardware necessary to implement the invention thereby reducing costs.

6. Regarding claim 2, see examiner's comments on claim 1 above and note that since in the combination as applied to claim 1 above, the horizontal difference signals are generated in accordance with green pixel values, then the horizontal difference signal is a signal corresponding to a luminance difference because the luminance signal is generated using majority green pixel signals as is well known in the art.

7. Regarding claim 3, see examiner's comments on claim 1 above and note the horizontally adjacent green pixels.
8. Regarding claim 4, see examiner's comments on claims 1 and 2 above and note the horizontal difference signal (horizontal correlation signal) also corresponds to a difference between digital video camera CCD output signals vertically adjacent at the same pixel position because of the equation $K1 = Sv/(Sh+Sv)$ where Sv is calculated according to equation 8 found in column 6 of Maenaka et al, which when considered with reference to figure 9 of Maenaka et al, shows pixels vertically adjacent starting at pixel G11.
9. Regarding claim 5, see examiner's comments on claim 1 above and apply examiner's comments on claims 3 and 4.
10. Regarding claim 6, see examiner's comments on claim 1 above and note that if the horizontal correlation is very strong, that is $Sh=0$, then from the equation $K1 = Sv/(Sh+Sv)$ it is clear that $K1$ would be equal to 1. Therefore no gain control would be executed on the vertical aperture (edge) correction signal (Vap). As Sh increases, $K1$ increases. Therefore gain control is only executed when the horizontal difference signal (Sh) exceeds a set threshold of zero.
11. Regarding claim 7, see examiner's comments on claim 2 above and note that since as explained in the examiner's comments on claim 6 gain control is only executed when the horizontal difference signal exceeds a set threshold of zero, then at some threshold value above zero (0+) execution of gain control starts. This value would be set by (depend on) the sensitivity of the equipment. Therefore gain control of the vertical

edge (aperture) correction signal would be executed when the horizontal difference signal corresponding to a luminance difference between horizontally adjacent pixels is not less than the above set threshold.

12. Regarding claim 8, see examiner's comments on claim 3 above and apply examiner's comments on claim 7 above regarding the set threshold.

Allowable Subject Matter

13. Claims 9 and 10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. A search of the prior art did not reveal wherein control of the vertical edge correction signal by the vertical edge signal gain controller is executed when the luminance difference between horizontally adjacent pixels is not less than a set threshold, and outputs of vertically adjacent digital video camera CCD output signals are not more than the set threshold as recited in claim 9, nor did it reveal wherein gain control of the vertical edge correction signal by the vertical edge signal gain controller is executed when the output difference in green signal between horizontally adjacent pixels is not less than a set threshold, and the difference between vertically adjacent digital video camera CCD output signals are not more than the set threshold as recited in claim 10.

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Hirose et al US Patent No: 5838371

Kasahara US Patent No: 5432563

Hibbard et al US Patent No: 4962419

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hedley Linton whose telephone number is (703) 305-4693. The examiner can normally be reached on 9am-6:30pm, Mon-Thu; 9am-5:30pm every other Fri..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Christensen can be reached on (703) 308-9644. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (305) 305-4700.

Hedley Linton
Examiner
Art Unit 2615
November 18, 2003



ANDREW CHRISTENSEN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600